Sept. 10, 1968 D. SPAONARA ET AL 3,401,000

DOMED SCREEN RADIANT BURNER

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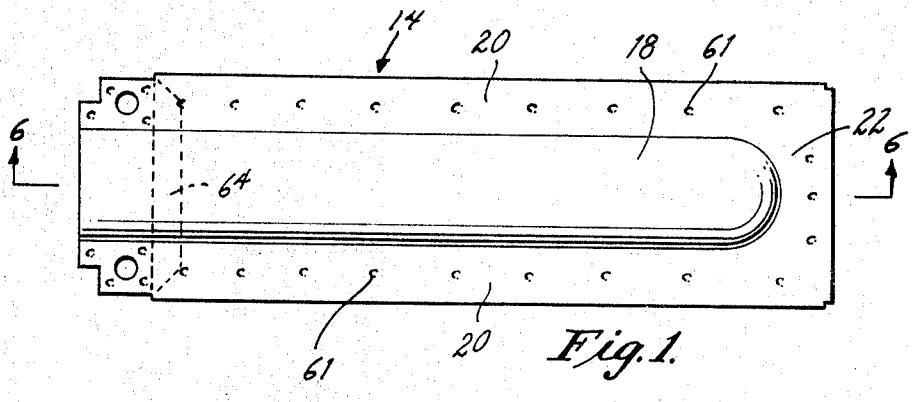


Fig. 1.

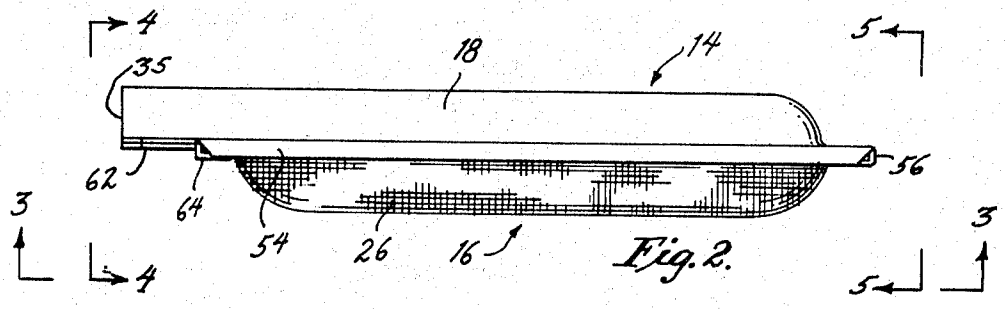


Fig. 2.

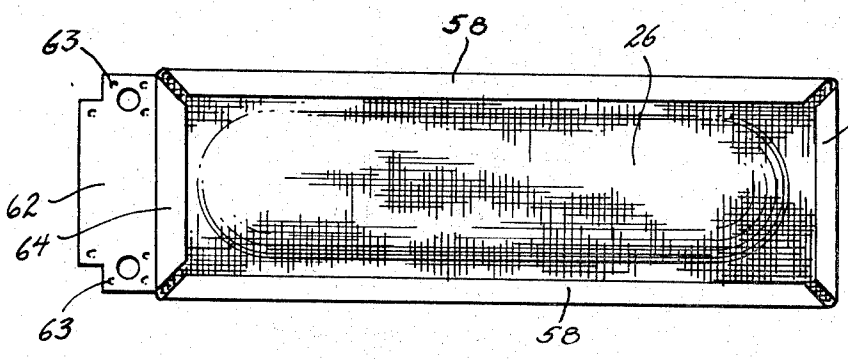


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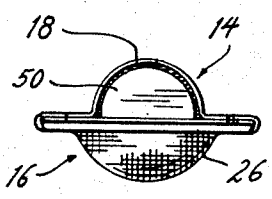


Fig. 4.

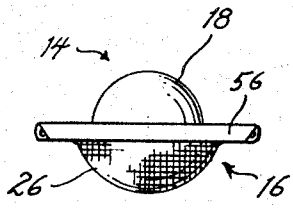


Fig. 5.

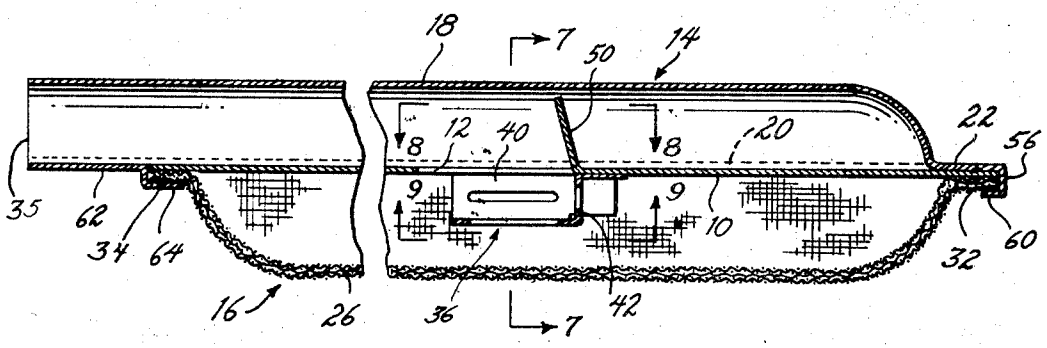
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Fig. 6.



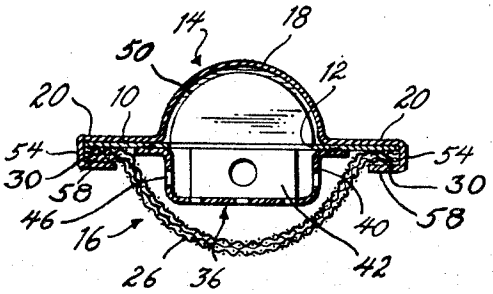


Fig. 7.

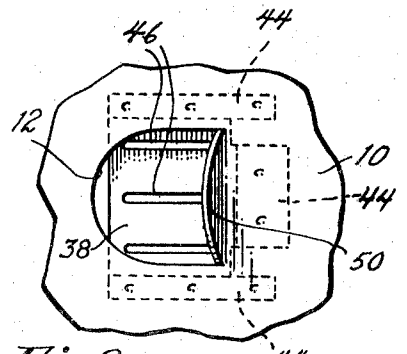


Fig. 8.

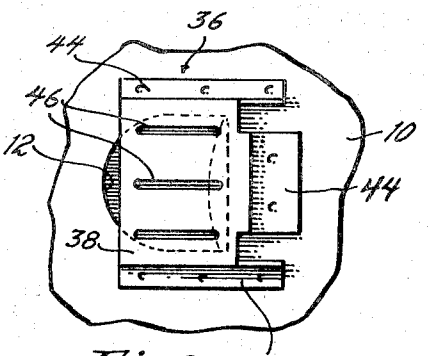
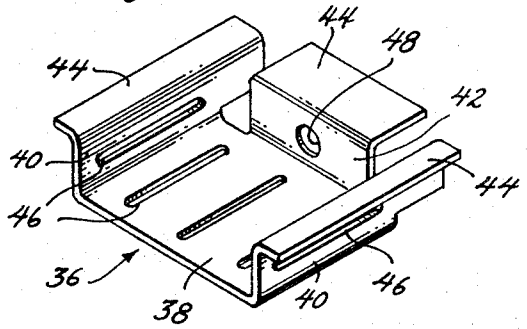


Fig. 9.

Fig. 10.



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DOMED SCREEN RADIANT BURNER

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Filed June 29, 1966, Ser. No. 561,595
4 Claims. (Cl. 431—329)

ABSTRACT OF THE DISCLOSURE

Gas burning infrared ray generator made of sheet metal and seamless. Also embodies means for insuring uniform combustion, and is not readily extinguished by ordinary gusts of wind.

This invention relates to a gas burning infrared ray generator and, more particularly, to an infrared ray generator which is especially adapted for broiling foods, and which, for convenience, is hereinafter referred to as a radiant burner.

The object of the invention is to produce an improved radiant burner of the type set forth.

A further object is to produce a radiant burner which dispenses with the use of a venturi tube and which is inexpensive to produce.

The full nature of the invention will be understood from the following specification and the accompanying drawings in which:

FIG. 1 is a top plan view of a radiant burner embodying the invention.

FIG. 2 is a side elevational view of the same.

FIG. 3 is a bottom plan view of the same.

FIG. 4 is an end view looking in the direction of line 4—4 on FIG. 2.

FIG. 5 is an end view looking in the direction of line 5—5 on FIG. 2.

FIG. 6 is a sectional view looking in the direction of line 6—6 on FIG. 1.

FIG. 7 is a fragmentary view looking in the direction of line 7—7 on FIG. 6.

FIG. 8 is a sectional view looking in the direction of line 8—8 on FIG. 6.

FIG. 9 is a fragmentary view looking in the direction of line 9—9 on FIG. 6.

FIG. 10 is a perspective view of the baffle shown in FIGS. 8 and 9.

The burner illustrated includes a central plate **10** having an opening **12**, a gaseous fuel receiving member **14** on one side thereof, and combustion sustaining member **16** on the other side thereof. As shown, the gas receiving member is above and the combustion sustaining member is below plate **10**.

The upper gas receiving member **14** is preferably formed of a flat sheet which is drawn to provide an elongated dome **18** which merges with flat side marginal portions **20** and with end flat marginal portion **22**.

The lower, combustion sustaining member **16** is preferably formed of one or more screens of the same or of different gauges, which, when drawn, form an elongated dome **26**, which merges with flat side marginal portions **30** and opposite end flat marginal portions **32** and **34**. As can be seen from FIGS. 6 and 7, when the gas receiving member and the combustion sustaining member are assembled on the opposite sides of plate **10**, the fuel admitted through the open end **35** of the gas receiving member will flow, through opening **12**, into the combustion sustaining member **16**.

To diffuse the gas uniformly through the screens, we provide a baffle **36** which is best shown in FIG. 10. This baffle includes a bottom wall **38**, side walls **40**, and an end wall **42**. The side walls and end walls of the baffle

are bent to form flanges **44** for attachment to the underside of plate **10**. Bottom wall **38** and side walls **40** are provided with calibrated slots **46** and end wall **42** is provided with a calibrated opening **48**. The end of the baffle facing the intake end of the burner is fully open. Some of the metal which is severed to form opening **12** is bent up to form a forwardly inclined baffle **50**.

To hold the parts together, side marginal portions **20** and end marginal portion **22** are extended downwardly as at **54** and **56**, respectively, and inwardly as at **58** and **60**, respectively, so as to wrap around and enclose the corresponding side and end edges of plate **10** and to enclose and underlie the side marginal portions **30** and end marginal portion **32** of the screens. This is clearly shown in FIGS. 3, 6 and 7. Optionally, the marginal portions **20** and **22** of member **14**, are spot-welded as at **61**.

This manner of securing the parts greatly reduces the cost of manufacture because it makes the use of seam-welding, or other means, for producing a gas tight peripheral seal unnecessary. This is due to the fact that any gas which leaks between the marginal portions of gas receiving member **14** and of plate **10** will be directed to the adjacent portions of the screens where the leaked gas will burn the same as the gas deliberately admitted through opening **12**. This makes it possible to resort to spot-welding instead of more expensive seam-welding or brazing, or other manner of producing a gas tight connection. To close the bottom portion of member **14** which extends beyond the inlet edge of plate **10** and screen marginal portion **34**, we provide an extension **62** which abuts plate **10**, FIG. 6, and which has an offset lip **64** which underlies the marginal portion **34** of the screen. Extension **62** is also spot-welded at **63**.

By making dome **18** substantially co-extensive with plate **10**, we provide a degree of reinforcement which makes it possible to use light-gauge sheet metal instead of castings, thus reducing the cost and reducing the weight of the unit.

As is well known, venturi tubes are conventionally used to insure the inspiration or entrainment of combustion air. But we have found that the construction above set forth, wherein the inlet opening is semi-cylindrical and is disposed beyond the inlet end of the combustion screen operates very satisfactorily. This also reduces the cost of manufacture.

As of now, we have no theoretical explanation of this phenomenon but actual testing shows that it works.

What we claim is:

1. A gas burner including:

an elongated plate, having an opening therein spaced inwardly from the sides and ends thereof,

a gas receiving member on one side of said plate comprising an elongated, substantially semi-cylindrical conduit adapted to overlie said opening and having a flat end portion and flat side marginal portions adapted to abut the corresponding side and end flat marginal portions of the plate,

a combustion sustaining member on the other side of said plate comprising an elongated screen of a substantially semi-cylindrical cross section adapted to underlie said opening and having a flat end portion and flat side marginal portions adapted to abut said side and end flat marginal portions of said plate,

one end of said conduit being open and extending beyond the corresponding end of said screen and said plate and the other end of said conduit being closed and substantially co-terminous with the corresponding end of the screen,

said flat end and side marginal portions of said gas receiving member being extended and bent to enclose

the corresponding side and end edges of said plate and the side and end flat marginal portions of the combustion sustaining member to clamp the gas receiving member and the combustion sustaining member to opposite sides of said plate.

2. The apparatus recited in claim 1 and a baffle secured to said one side of said plate and extending into said gas receiving member to deflect the incoming gas into said opening in said plate.

3. The apparatus recited in claim 1 and an enclosing member adapted to close the end of said conduit extending beyond said plate and having a lip portion which underlies the end marginal portions of said screen and said plate.

4. The apparatus defined in claim 1 and a baffle on the opposite side of said plate, said last mentioned baffle comprising:

opposite side walls each having an opening therein,

an end wall having an opening therein,

a bottom wall having an opening therein,

and means securing said baffle to said other side of said plate.

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U.S. DEPARTMENT OF COMMERCE

PATENT OFFICE

Washington, D.C. 20231

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,401,000 September 10, 1968

Domenick Saponara et al.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

In the sheets of drawings, line 1, "D. SPAONARA" should read -- D. SAPONARA --; lower right-hand corner "DOMENICK SRAONARA" should read -- DOMENICK SAPONARA --. In the heading to the printed specification, line 3, Domenick Spaonara" should read -- Domenick Saponara --.

Signed and sealed this 17th day of March 1970.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents